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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,901	05/02/2001	Masajiro Inoue	SIW-008	7510
959	7590	08/18/2005	EXAMINER	
LAHIVE & COCKFIELD, LLP. 28 STATE STREET BOSTON, MA 02109			ALEJANDRO, RAYMOND	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/847,901

Applicant(s)

INOUE ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-7 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1,2 and 4-7 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 05/02/01 & 09/04/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/04/05 has been entered.

This is in reply to the amendment in connection with the abovementioned RCE. The applicants have overcome the 35 USC 102 rejection and 35 USC 103 rejection. Refer to the foregoing amendment for remarks on applicant's rebuttal arguments. However, the present claims (including newly added claims 6-7) are again rejected over newly discovered art as presented infra and for the reasons of record:

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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2. Claims 1-2 and 4-7 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 of copending Application No. 10/752768 (*US Patent Application Publication 2004/0137305*). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The copending application '768 claims the following (CLAIMS 1-7):

1. A fuel cell comprising:

a membrane electrode assembly having a solid polymer electrolyte membrane, an anode side diffusion electrode disposed at one side of the solid polymer electrolyte membrane, and a cathode side diffusion electrode disposed at the other side of the solid polymer electrolyte membrane;

a pair of separators which hold the membrane electrode assembly, each of the separators having an opening for supplying or discharging one of fuel gas, oxidant gas, and coolant to or from the membrane electrode assembly;

a seal, which was liquid sealant at the time of application, which encloses the openings of the separators, the seal on one separator making contact with the sealant on the other separator to seal the periphery of the opening.

2. A fuel cell according to claim 1, wherein

the separators have grooves which enclose the openings, and

the seal is provided in the grooves.

3. A fuel cell comprising:

a membrane electrode assembly having a solid polymer electrolyte membrane, an anode side diffusion electrode disposed at one side of the solid polymer electrolyte membrane, and a cathode side diffusion electrode disposed at the other side of the solid polymer electrolyte membrane;

a pair of separators which hold the membrane electrode assembly, each of the separators having an opening for

supplying or discharging one of fuel gas, oxidant gas, and coolant to or from the membrane electrode assembly;

a seal, which was liquid sealant at the time of application, which encloses the openings of one of the separators, and which makes contact with the other separator to seal the periphery of the opening.

4. A fuel cell according to claim 3, wherein

one of the separators has a groove which encloses the opening, and

the sealant is provided in the grooves.

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5. A fuel cell stack having a plurality of fuel cell units, wherein
each of the fuel cell units comprises:
a membrane electrode assembly having a solid polymer electrolyte membrane, an anode side diffusion electrode disposed at one side of the solid polymer electrolyte membrane, and a cathode side diffusion electrode disposed at the other side of the solid polymer electrolyte membrane;
a pair of separators which hold the membrane electrode assembly;
an adhesive seal, provided between the separators, which was liquid sealant at the time of application;
a non-adhesive seal provided between the separator of one fuel cell unit and the separator of the other fuel cell unit.
6. A fuel cell stack according to claim 5, wherein the non-adhesive seal was liquid sealant at the time of application.
7. A fuel cell stack according to claim 5, wherein the non-adhesive seal was solid sealant at the time of application.

In this instance, the claimed subject matter of the copending application '768 fully encompasses the subject matter of the present claims. Thus, the claims of the copending application '768 anticipate the present claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

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claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

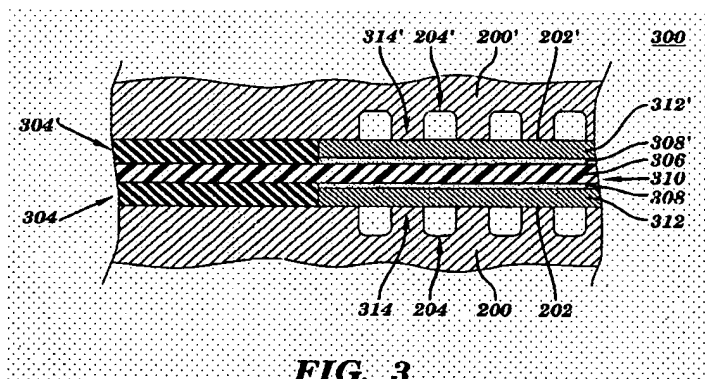
5. Claims 1-2 and 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones 6007933 further in view of the Japanese publication JP 59-103077 (hereinafter referred to as "*the JP'077 publication*").

The instant application is directed to a fuel cell wherein the disclosed inventive concept comprises the specific seal feature.

As to claim 1:

Jones discloses a fuel cell assembly including end plates and current collectors/conductor plates with a working section therebetween (col 5, lines 15-20); wherein working section includes a number of layers (col 5, lines 25-26); preferably, a plurality of layers form one or more PEM-type fuel cells (col 5, lines 35-38). PEM represents a proton exchange membrane or polymer Electrolyte membrane, the PEM is a solid polymer electrolyte (col 1, lines 26-38).

Figure 3 shows fluid flow plates serving as flow field plates in a fuel cell.



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As seen in Figure 3, fuel cell 300 includes the membrane electrode assembly (MEA) 310 comprising a solid polymer electrolyte 306, catalyst 308 and 308' which facilitate chemical reaction are applied to the anode and cathode sides, respectively of the solid polymer electrolyte. This unit can be referred to as a membrane electrode assembly (col 6, line 56 to col 7, line 4). The MEA is sandwiched between anode and cathode gas diffusion layers 312 and 312', respectively (col 7, lines 5-8).

For purposes of illustration, Figure 3 also depicts the fuel cell with fluid flow plates 200 and 200' serving as flow field plates (it is noted that separator plates are sometimes referred to as flow field plates, that is, separator plates are also conventionally known in the art as flow field plate), in particular, flow field plate 200 might serve as an anode side of the fuel cell, and flow field plate 200' might serve as a cathode side of the fuel cell. That is, face 202 might comprise an anode face, and face 202' might comprise a cathode face (col 6, lines 44-50).

Jones discloses that gasketing material or gaskets 304, 304' can be employed to seal peripheral holes. A given gasket might take the form of, for instance, a frame gasket made from polytetrafluoroethylene material (col 6, lines 34-42). As depicted in Figure 3, the gasketing material 304, 304' contacts the end faces of both gas diffusion layers 312 and 312'.

With respect to gasketing material or gasket, it is noted that a gasket is a material or a member used to make a joint fluid tight. Accordingly, gasketing material is a sealing agent which provides a tight closure to prevent the passage or return of fluids so as to close or male secure against access, leakage or passage. Thus, the gasketing material or gasket is interpreted to serve as a seal provided on the flow field plates.

Examiner's note (A): with respect the limitation reciting that "a liquid sealant...which hardens while in close contact with both end faces of the first gas diffusion layer and the second gas diffusion layer to provide a seal with certain degree of elasticity" and the likes, it is noted that applicants disclose the liquid sealant hardens into solid sealant while maintaining certain degree of elasticity even after the seal has been formed; and that the liquid sealant is made of a thermosetting fluorine-containing (refer to page 11, third full paragraph of applicants' specification). Given that, it is noted that the recitation which hardens while in close contact with both end faces of the first gas diffusion layer and the second gas diffusion layer to provide a seal with certain degree of elasticity (or a seal, provided onto the separators, which was liquid sealant at the time of application) is interpreted as a solid seal per se because such limitation refers to the initial state of the liquid sealant at the time of application, but the final state (the working seal) of the seal is solid as the liquid sealant hardens into solid sealant; accordingly, it is noted that Jones' teaching encompasses the solid seal formed to contact the fuel cell components. Thus, Jones' frame gasket made from polytetrafluoroethylene material (fluorine-container polymer) is a solid sealing material employed to provide a tight closure or seal in the fuel cell.

In addition, as to the method limitation, i.e. "which hardens...to provide a seal with a certain degree of elasticity", it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.

With respect to claim 2:

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As illustrated in Figure 3, the edge of solid polymer membrane 306 extends beyond (extended/projecting portion) the end faces of the anode and cathode side; and the gasketing material 304, 304' contacts the extended portion of the solid polymer electrolyte.

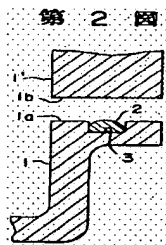
With respect to claim 4:

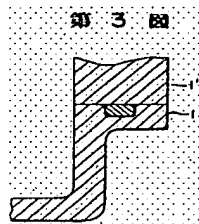
As shown in Figure 3, the gasketing material 304, 304' contacts the end faces of both gas diffusion layers 312-catalyst 308 and gas diffusion layers 312'-catalyst 308' which are considered to be the anode and cathode electrode sides, respectively.

Jones discloses a fuel cell apparatus according to the aspect expressed above. Nevertheless, Jones does not expressly disclose the specific liquid sealant and grooving bonding structure.

The JP'077 publication teaches a sealing configuration for sealing component members including a groove 3 for applying a liquid gasket 2 to being provided on either one or both of the bonding faces 1a, 1b of components 1, 1' to be bonded (ABSTRACT). Then, the liquid gasket 2 is applied to the groove 3; and the respective bonding faces 1a, 1b of the component members 1, 1' are abutted against and bonded to each other after application of the liquid gasket 2 to the application groove 3 formed on the bonding face 1a of the component member 1 (ABSTRACT).

Figures 2-3





Consequently, in light of these disclosures, it would have been obvious to one skilled in the art at the time the invention was made to use the specific liquid sealant and grooving bonding structure of the JP'077 publication in the fuel cell of Jones as the JP'077 publication discloses that such specific liquid sealant and grooving bonding structure make sealing performance between component members to be favorably bonded; in addition to that, the specific features provide a mechanically improved component-seal (dimension) relationship; and particularly, the groove allows to enhance sealing between the component members.

Response to Arguments

6. Applicant's arguments with respect to claims 1-2 and 4-7 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Primary Examiner
Art Unit 1745



RAYMOND ALEJANDRO
PRIMARY EXAMINER